APPLICATION

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SECURITIES PRICING SYSTEM

BACKGROUND

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The following invention relates to a system and method for providing a client with a price for a security and, in particular, for a system and method for dynamically adjusting price quotes generated by an automated trading system.

Financial institutions often use automated trading systems to support their clients' trading requests. Generally, these automated trading systems provide the client with price quotes upon

10 which the client may base a trading decision. Such trading systems may provide price quotes for any type of security such as FX securities, equities, commodities and debt instruments. (See, for example, Kalmus et al., "Automated Securities Trading System, U.S. Patent No. 4,674,044).

Referring now to FIG. 1, there is shown a block diagram of an exemplary prior art trading system 10. Trading system 10, operated by a financial institution, is accessed by a client access

15 device, operated by a client, for receiving price quotes in securities and issuing trade requests in such securities. Trading system 10 includes a pricing engine 14 that calculates a price quote in response to a client price request using known pricing techniques based on real-time market information (for e.g., interest rate information). A responsive price quote may also be provided

20 manually such as directly by a salesperson and/or trader. Upon receiving a price quote, the client may indicate to trading system 10 a desire to trade in the particular security based on the price quote. Trading system 10 also includes a settlement system 15 for implementing the steps required to credit the requested trade to the client's account and a hedging module 16 that

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interfaces with external markets for eliminating any risk to the financial institution as a result of accepting the trade.

Financial institutions typically take into consideration the type and size of the client when providing the client with a price quote. For example, the financial institution may quote

5   better prices to those clients that provide the financial institution with a larger amount of trading business. To provide this price differentiation in the context of an automated trading system, some prior art pricing engines provide a client with price quotes from one of a discrete number of pricing levels. The pricing level that is given to a particular client is based on the volume of trading the client has done with the financial institution. So, for example, if a client has provided

10   the financial institution with a significant amount of trading business, that client may placed in a more favorable (to the client) pricing level. Thus, when the client requests a price quote from the trading system, the pricing engine will provide the client with price quotes according to the designated pricing level.

A drawback of the pricing engines of prior art trading systems is that the prices that are

15   provided to clients are either uniform for all clients or are based on a limited number of discrete pricing levels. First, a discrete number of pricing levels is often insufficient and cumbersome for providing tailored price quotes to a large client base. Also, basing price level selection on the particular client's prior trading volume does not always reflect the current value of the client to the financial institution. For instance, other characteristics of the client, such as the client's

20   trading patterns and profits generated, may often be useful as a basis for adjusting pricing. Furthermore, the prior art pricing engines do not dynamically adjust pricing in order to achieve a specific result such as, for example, maximizing profits per customer or increasing overall

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trading volume. Accordingly, it is desirable to provide a system and method for dynamically

adjusting price quotes generated by an automated trading system.

SUMMARY OF THE INVENTION

The present invention is directed to overcoming the drawbacks of the prior art. Under the

present invention a system is provided for adjusting a price for a security, the price having a

spread, and including a pricing engine for providing to a client a price quote for the security.

Also included is a past trades database for storing at least one past trade executed by the client.

A price adjustment module in communications with the pricing engine is included for adjusting

the spread provided to the client based on the at least one past trade.

In an exemplary embodiment, a price quote log for storing at least one past price quote

received by the client is included wherein the price adjustment module adjusts the spread based

on the at least one past price quote.

In another exemplary embodiment, the spread is adjusted in an increment.

In yet another exemplary embodiment, the increment is a multiple of a pip.

In still yet another exemplary embodiment, the price adjustment module receives from

the price quote log a number of price quotes the pricing engine has provided the client and a

number of trades from the past trade database the client has executed and wherein the price

adjustment module causes the spread to be adjusted based on a ratio of the number of trades to

the number of price quotes.

In an exemplary embodiment, the price adjustment module causes the spread to be

widened by the increment if the ratio is greater than one-half.

In another exemplary embodiment, the price adjustment module causes the spread to be

narrowed by the increment if the ratio is less than one-half.

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In yet another exemplary embodiment, the price adjustment module receives from the price quote log a number of bid price quotes the pricing engine has provided the client and the price adjustment module receives from the past trade database a number of trades executed at a bid price by the client and wherein the price adjustment module causes the spread to be adjusted

5   based on a ratio of the number of trades executed at a bid price to the number of bid price quotes.

In still yet another exemplary embodiment, the spread has a bid price and wherein the spread is adjusted by adjusting the bid price.

In an exemplary embodiment, the price adjustment module receives from the price quote log a number of ask price quotes the pricing engine has provided the client and the price

10   adjustment module receives from the past trade database a number of trades executed at an ask price by the client and wherein the price adjustment module causes the spread to be adjusted based on a ratio of the number of trades executed at an ask price to the number of ask price quotes.

In another exemplary embodiment, the spread has an ask price and wherein the spread is

15   adjusted by adjusting the ask price.

In yet another exemplary embodiment, the price adjustment module receives from the price quote log a number of ask price quotes the pricing engine has provided the client and the price adjustment module receives from the past trade database a number of trades executed at an ask price by the client and wherein the price adjustment module causes the spread to be adjusted

20   based on a ratio of the number of trades executed at an ask price to the number of ask price quotes.

In still yet another exemplary embodiment, the spread has an ask price and the ratio of the number of trades executed at a bid price to the number of bid price quotes is less than the

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ratio of the number of trades executed at an ask price to the number of ask price quotes and wherein the spread is adjusted by increasing the ask price.

In an exemplary embodiment, the spread has a bid price and the ratio of said number of trades executed at a bid price to the number of bid price quotes is less than the ratio of the number of trades executed at an ask price to the number of ask price quotes and wherein the spread is adjusted by increasing the bid price.

In another exemplary embodiment, the spread has an bid price and the ratio of the number of trades executed at a bid price to the number of bid price quotes is greater than the ratio of the number of trades executed at an ask price to the number of ask price quotes and wherein the spread is adjusted by increasing the bid price.

In another exemplary embodiment, the spread has a ask price and the ratio of the number of trades executed at a bid price to the number of bid price quotes is greater than the ratio of the number of trades executed at an ask price to the number of ask price quotes and wherein the spread is adjusted by increasing the ask price.

In yet another exemplary embodiment, the pricing engine provides price quotes to a plurality of clients and wherein the price adjustment module causes the spread provided to a randomly selected one of the plurality of client to be widened.

Under the present invention, a method is provided for adjusting a price for a security provided to a client, the price having a spread, and includes the step of storing at least one past trade executed by the client. Next, the spread based on the at least one past trade is adjusted.

In an exemplary embodiment, the method includes the steps of storing at least one past price quote received by the client and adjusting the spread based on the at least one past price quote.

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In another exemplary embodiment, the method includes the step of adjusting said spread by an increment.

In yet another exemplary embodiment, the method includes the steps of receiving a number of price quotes provided to the client, receiving a number of trades the client has executed and adjusting the spread based on a ratio of the number of trades to the number of price quotes.

In still yet another exemplary embodiment, the method includes the step of widening the spread by the increment if the ratio is greater than one-half.

In an exemplary embodiment, the method includes the step of narrowing the spread by the increment if the ratio is less than one-half.

In another exemplary embodiment, the method includes the steps of receiving a number of bid price quotes provided to the client, receiving a number of trades executed at a bid price by the client and adjusting the spread based on a ratio of the number of trades executed at a bid price to the number of bid price quotes.

In yet another exemplary embodiment, the method includes the step of adjusting the bid price.

In still yet another exemplary embodiment, the method includes the steps of receiving a number of ask price quotes provided to the client, receiving a number of trades executed at an ask price by the client and adjusting the spread based on a ratio of the number of trades executed at an ask price to the number of ask price quotes.

In an exemplary embodiment, the method includes the step of adjusting the ask price.

In another exemplary embodiment, the method includes the steps of receiving a number of ask price quotes provided to the client, receiving a number of trades executed at an ask price

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by the client, and adjusting the spread based on a ratio of the number of trades executed at an ask price to the number of ask price quotes.

In yet another exemplary embodiment, the spread has an ask price and the ratio of the number of trades executed at a bid price to the number of bid price quotes is less than the ratio of the number of trades executed at an ask price to the number of ask price quotes and wherein the step of adjusting said spread based on a ratio of the number of trades executed at an ask price to the number of ask price quotes includes the step of increasing the ask price.

In still yet another exemplary embodiment, the spread has a bid price and the ratio of the number of trades executed at a bid price to the number of bid price quotes is less than the ratio of the number of trades executed at an ask price to the number of ask price quotes and wherein the step of adjusting the spread based on a ratio of the number of trades executed at an ask price to the number of ask price quotes includes the step of increasing the bid price.

In an exemplary embodiment, the spread has a bid price and the ratio of the number of trades executed at a bid price to the number of bid price quotes is greater than the ratio of the number of trades executed at an ask price to said number of ask price quotes and wherein the step of adjusting the spread based on a ratio of the number of trades executed at an ask price to the number of ask price quotes includes the step of increasing the bid price.

In another exemplary embodiment, the spread has a ask price and the ratio of the number of trades executed at a bid price to the number of bid price quotes is greater than said ratio of the number of trades executed at an ask price to the number of ask price quotes and wherein the step of adjusting the spread based on a ratio of the number of trades executed at an ask price to the number of ask price quotes includes the step of increasing the ask price.

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In yet another exemplary embodiment, the method includes the steps of providing price quotes to a plurality of clients and widening the spread provided to a randomly selected one of the plurality of client.

Accordingly, a method and system is provided for dynamically adjusting price quotes generated by an automated trading system.

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts that will be exemplified in the following detailed disclosure, and the scope of the invention will be indicated in the claims. Other features and advantages of the invention will be apparent from the description, the drawings and the claims.

DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the invention, reference is made to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a block diagram of an exemplary prior art trading system; and

FIG. 2 is a block diagram of a trading system in which price quotes are dynamically adjusted in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIG. 2, there is shown a block diagram of a trading system 20 in which price quotes are dynamically adjusted in accordance with the present invention. Elements that are similar to elements included in trading system 10 of FIG. 1 are identically labeled and a detailed description thereof is omitted.

Trading system 20 includes a past trades database 21 that stores all the past trades executed by each client through trading system 20. In an exemplary embodiment, past trades

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database 21 is in communications with settlement system 15 and receives from settlement system 15 each trade that was executed via trading system 20. Alternatively, past trades database 21 may receive past trade information from any other source that monitors all trading activity including from any other component within trading system 20. Past trades database 21 may store any information pertaining to a trade executed through trading system 20 including, by way of non-limiting example, the name of the client executing the trade, the time of the trade, the security type, the type of trade (buy/sell), the price and the amount of units/shares traded and the internal transfer price at the time of the trade.

Also included in trading system 20 is a price quote log 23 that stores all price quotes previously provided to each client by pricing engine 24 of trading system 20. In an exemplary embodiment, price quote log 23 is in communications with pricing engine 24 and receives from pricing engine 24 each price quote provided. Price quote log 23 may store any information pertaining to a quote provided by pricing engine 24 including, by way of non-limiting example, the client name requesting the quote, the security type, the bid/ask spread, the time of the price quote, the amount of shares/units for which a price was requested, whether the request was for a one-way or two-way quote, whether a trade was executed based on that price quote and what the internal transfer price was at the time of the price quote.

Trading system 20 also includes a price adjustment module 22 that dynamically adjusts the price quotes provided by pricing engine 24 based on the past trade information received from past trades database 21 and the previous price quotes received from price quote log 23. Price adjustment module may adjust price quotes based on any client characteristic that may be derived from the information stored in past trades database 21 and price request log 23 such as, by way of non-limiting example, the profits to the financial institution as a result of the particular

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client's trading activity, the client's trading volume, the percentage of trades the client does

relative to the number of price requests the client receives from system 20 and the type of

products for which the client requests price quotes and executes trades. In addition, price

adjustment module 22 may adjust price quotes provided by pricing engine 24 to achieve any

5   desired objective such as, by way of non-limiting example, increase trading volume per client

and increase trading profit per client (where profit is calculated, for example, as the difference

between the trade price and the internal transfer price at the time of the trade).

For example, if, based on a particular client's past trades stored in past trades database 3

21, price adjustment module 22 determines that the client primarily trades EUR currencies and

10   trades in CHF currencies infrequently, price adjustment module 22 then directs pricing engine 24

to widen the pricing spread for quotes in CHF currency trades given to the client by an increment

so that the financial institution increases its overall profits for those lower volume trades.

Alternatively, price adjustment module 22 directs pricing engine 24 to narrow the spread for

quote in CHF currency trades given to the client by an increment in an attempt to increase the

15   volume of CHF currency trades the client performs.

The increment by which price adjustment module 22 directs pricing engine 24 to adjust

pricing may be any suitable increment including, by way of non-limiting example, a multiple of

a pip (one ten-thousandth of a unit).

In an exemplary embodiment, price adjustment module 22 tracks the number of trades a

20   particular client performs as a percentage of the number of price quotes the client requests from

system 20. If price adjustment module 22 determines that the client has requested a large

number of quotes for a particular security but has executed relatively few trades, price

adjustment module 22 may direct pricing engine 24 to narrow the spread in quotes provided to

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the client for that security by an increment in order to increase the volume of trades performed by the client in that security. For example, if the number of trades the client has executed is less than fifty-percent of the number of price requests the client has received, then price adjustment module 22 causes future price quotes provided to the client by pricing engine 24 to be narrowed

5   by an increment.

In an exemplary embodiment, if price adjustment module 22 determines that a particular client executes a large percentage of trades for which the client requests a price quote but that the profits to the financial institution for such trades are low, then price adjustment module 22 directs pricing engine 24 to widen the spread for quotes provided to the client in order to increase

10   the overall profit to the financial institution generated by such client's trades. For example, if the number of trades the client has executed is greater than fifty-percent of the number of price requests the client has received, then price adjustment module 22 causes future price quotes provided to the client by pricing engine 24 to be widened by an increment. If after the spread is widened the client trading volume drops but the profit to the financial institution either remains

15   the same or increases, then price adjustment module 22 may not adjust any further the price quotes provided by pricing engine 24 to the client. If, on the other hand, the trading volume drops and the profits drop for the client, price adjustment module 22 may direct pricing engine 24 to further widen the spread of price quote provided to the particular client in order to increase profits.

20   In an exemplary embodiment, price adjustment module 22 tracks the number of price quotes the client has requested on the bid and on the ask and also determines how many of these price requests have resulted in trades. If, for example, price adjustment module 22 determines that the client executes trades for five-percent of all price quotes received on the bid but executes

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trades for ninety-percent of all price quotes received on the ask, then price adjustment engine 22 may direct pricing engine 24 to skew price quotes provided to the client by increasing the ask price by an increment. In this way, the financial institution can maximize the profits it generates form the client's propensity for trading at the ask. Alternatively, price adjustment engine 22 may direct pricing engine 24 to skew price quotes provided to the client by increasing the bid price by an increment in order to exact a premium on the client for trading on an infrequent side.

In an exemplary embodiment, price adjustment module 22 directs pricing engine 23 to widen the spread of price quotes provided to a randomly selected client by an increment. Price adjustment module 22 then tracks the trading volume and profits generated by the trades of the randomly selected to determine that the spread widening has had a desirable affect on profits and/or volume.

In an exemplary embodiment, trading system 20 includes a salesperson access device 25 (for e.g., a personal computer operating suitable software) that interfaces with price adjustment module 22, past trades database 21 and price quote log 23 for enabling a salesperson to track the price adjustments provided by price adjustment module 22 to the clients of the particular salesperson. In addition, the salesperson may use access device 25 to view the pricing rules applied by price adjustment module 22 in any particular instance and adjust the pricing rules accordingly. The salesperson may also use access device 25 to access past trade database 21 and view client trading activity by currency or any other desired parameter as well as to access price quote log 23 to view the number of price requests provided to the clients. In addition, access device 25 may include software to calculate any desired result including, by way of non-limiting example, the percentage of trades per price quotes provided for different periods of time. Also, a salesperson operating access device 25 may receive an automatic message notification each time

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one of the salesperson's clients trade, the spreads the clients is quoted by pricing engine 24, the price adjustments made by price adjustment module 22 to the price quotes as well as any other piece of information desired by the salesperson.

Accordingly, a system and method is provided for dynamically adjusting price quotes generated by an automated trading system in order to achieve a desired objective such as, for example, increased profits per client. While a number of scenarios in which price adjustment module 22 adjusts price quotes generated by pricing engine 24 have been discussed, it will be obvious based on the above to incorporate into price adjustment module 22 any other price adjustment rules suitable for any other type of situation for the purpose of tuning pricing engine 24 in order to achieve any desired objective.

A number of embodiments of the present invention have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and scope of the invention. Based on the above description, it will be obvious to one of ordinary skill to implement the system and methods of the present invention in one or more computer programs that are executable on a programmable system including at least one programmable processor coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. Each computer program may be implemented in a high-level procedural or object-oriented programming language, or in assembly or machine language if desired; and in any case, the language may be a compiled or interpreted language. Suitable processors include, by way of example, both general and special purpose microprocessors. Furthermore, alternate embodiments of the invention that implement the system in hardware, firmware or a combination of both hardware and software, as well as distributing modules and/or data in a different fashion will be apparent to those skilled in

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the art and are also within the scope of the invention. In addition, it will be obvious to one of

ordinary skill to use a conventional database management system such as, by way of non-

limiting example, Sybase, Oracle and DB2, as a platform for implementing the present invention.

Also, network access devices can comprise a personal computer executing an operating system

5   such as Microsoft Windows™, Unix™, or Apple Mac OS™, as well as software applications,

such as a JAVA program or a web browser. Network access devices 203-205 can also be a

terminal device, a palm-type computer, mobile WEB access device or other device that can

adhere to a point-to-point or network communication protocol such as the Internet protocol.

Computers and network access devices can include a processor, RAM and/or ROM memory, a

10   display capability, an input device and hard disk or other relatively permanent storage.

Accordingly, other embodiments are within the scope of the following claims.

It will thus be seen that the objects set forth above, among those made apparent from the

preceding description, are efficiently attained and, since certain changes may be made in

carrying out the above process, in a described product, and in the construction set forth without

15   departing from the spirit and scope of the invention, it is intended that all matter contained in the

above description shown in the accompanying drawing shall be interpreted as illustrative and not

in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the

generic and specific features of the invention herein described, and all statements of the scope of

20   the invention, which, as a matter of language, might be said to fall therebetween.

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